North Shore Restoration Project

Botanical Biological Assessment, Biological Evaluation, and Invasive Plant Risk Assessment

Japhia Huhndorf, Upper Lake District Botanist

21 January 2020

Introduction

The North Shore Restoration Project encompasses almost 40,000 acres within the footprint of the Ranch Fire, which burned approximately 280,000 acres of the Mendocino National Forest in July to September 2018. The purpose of this document is to analyze the potential effects on botanical resources from implementing the proposed action, no action, or one of the other action alternatives. Effects to federally listed plant species, Forest Service Sensitive species, and Survey and Manage species will be considered. Each alternative will also be considered for its relative risk of introduction and/or spread of non-native invasive plant species.

The purpose and need for this project can be found in Chapter 1 the Environmental Analysis document for this project.

Proposed Action and Alternatives

1. No Action Alternative
2. Proposed action that will include the use of herbicides for release of reforestation plantings as well as for invasive plant treatments.
3. Proposed action with the use of herbicides for invasive plant treatment only, except in research plots which would incorporate herbicides for release treatments.
4. Proposed action with no herbicide use.
5. Proposed action that includes retaining all standing snags and coarse woody debris greater than 21 inches DBH.

Management Direction

All Threatened, Endangered, and Sensitive (TES) plant species are managed according to policy direction in the Forest Service's Manual and Handbook for TES plants. In planning and implementing resource projects, known locations of TES plants are avoided or effects on them are mitigated. Forest Service policy calls for maintenance of viable populations of sensitive species throughout their geographic range (FSM 2672.32; FSM 2670.5.22; USDA 2005). Additional management direction for TES plant species is contained in the 1995 Mendocino National Forest Land Resource Management Plan (LRMP). The goal articulated by the LRMP is to "provide favorable habitat conditions for increased populations of sensitive plants so they no longer require special management consideration" (LRMP, IV-3; USDA 1995).

Invasive plant species are managed according to policy direction in the Forest Service Manual for Invasive Species Management. Objectives are based on an Integrated Pest Management model, with the following activities used in priority order: preventing new infestations and spread, Early Detection Rapid Response of new/small infestations, and control and management of established infestations (FSM 2902; USDA 2011). The MNF LRMP provides additional direction of eradicating Class A noxious weeds within the Forest (LRMP, IV-2; USDA 1995).

Affected Environment

The North Shore project area is comprised of almost 40,000 acres and primarily of forest and chaparral vegetation types. Pine-oak woodland and mixed conifer forest dominate the middle and higher elevations, while chaparral types are typically found lower in elevations, on south and west-facing slopes. The entire area burned – much of it at moderate or higher intensity – during the 2018 Ranch Fire.

There is a narrow band of serpentine bedrock/soils along the northeastern edge of the project boundary, but it is not within any proposed project units and occurs within a patchwork of MNF lands and private inholdings.

Species Considered

According to the US Fish and Wildlife Service, possible federally listed plant species in the project area include the Threatened *Howellia aquatilis* (water howellia) and Endangered *Sidalcea keckii* (Keck's checker-mallow).

The Regional Forester maintains a list of sensitive plant species for the Forest Service. The species for the Mendocino National Forest are listed in Table 1. Species that are also listed as Survey and Manage species are noted in the table.

Table 1: Sensitive plant species for the Mendocino National Forest

Scientific name	Common name	Habitat
Vascular Plants		
Anisocarpus scabridus	scabrid alpine tarplant	Rock outcrops and scree slopes; open, sub-alpine veg.; above 5500 ft.
Antirrhinum subcordatum	dimorphic snapdragon	Serpentine chaparral openings on Henneke soils; fine talus or shot texture decomposed mudstone / sandstone
Balsamorhiza macrolepis	big-scale balsamroot	In openings or under light brush cover in ponderosa pine, chaparral, vernally moist meadows and grasslands, and oak woodlands; sandstone, serpentine, or basalt outcrop; rocky clays of metasedimentary origin; loams of granitic origin; elev. Below 4,600 ft.
Botrychium crenulatum	scalloped moonwort	Meadows, seeps, springs, and riparian areas; most often found on the lip of creek banks or on their sides, mostly within coniferous forest habitats; strong mycorrhizal requirements
Brodiaea rosea	Indian Valley brodiaea	Grows in open, sunny spots in oak woodland at the edges of ephemeral drainages, serpentine flats, and gentle slopes in gravelly (red) gumbo clay derived from serpentine.
Calycadenia micrantha	small-flowered calycadenia	Dry, open, rocky ridges, hillsides, and talus 1600 – 5000 ft elev.; grows only in areas of low plant density, in or closely associated with exposed, very barren, rocky areas or areas of packed mineral materials.
Cypripedium fasciculatum (Also a Survey and Manage species)	clustered lady's-slipper	Douglas-fir-dominated and mixed conifer forests in the mid-late seral stands whose structure allows some light to reach the forest floor. Often on north aspect slopes and riparian areas. Below 6500 ft elev.
Cypripedium montanum	mountain lady's-slipper	Douglas-fir, white fir, and mixed conifer forests in mid-

Scientific name	Common name	Habitat
(Also a Survey and Manage species)		late seral stages, as well as oak woodlands and riparian areas. Aspect is primarily northerly; moderate slopes; canopy generally 60-80%; elev below 7200 ft.
Epilobium nivium	Snow Mountain willowherb	Grows in crevices of rocky outcrops and dry talus and shaley slopes on mountain tops, typically with a southern exposure. Also found on rock outcrops down into the montane chaparral and mixed conifer type.
Eriastrum tracyi	Tracy's eriastrum	Foothill chaparral, on extremely shallow mudstone or sandstone soils; disturbed openings in chamise on serpentine.
Eriogonum nervulosum	Snow Mountain buckwheat	Barren serpentine outcrops and slopes. At higher elevations (above 5000 ft) it grows on exposed rocky flats and scree slopes or in the crevices of outcrops. On serpentine barrens it grows down to about 1,000 ft elev.
Eriogonum tripodum	tripod buckwheat	Alluvial serpentine soils in foothill and cismontane woodlands.
Harmonia stebbinsii	Stebbins' harmonia	On serpentine soils on south-facing slopes
Hesperolinon drymarioides	drymaria-like western flax	Serpentine grey pine – chaparral, northern interior cypress forest, and mixed serpentine chaparral; openings between trees and shrubs in dark red serpentine soils of the Henneke series
Leptosiphon nuttallii ssp. *howellii*	Mt. Tedoc leptosiphon	Commercial timber stands; Jeffrey pine, incense-cedar, Douglas-fir, and white fir at middle elevations on igneous-derived soils
Lewisia stebbinsii	Stebbins' lewisia	Dry, exposed gravelly flats in volcanic rock and rubble, adjacent to sparse Jeffrey pine / white fir forest; elev. 5200 – 6700 ft.
Lupinus antoninus	Anthony Peak lupine	Rocky outcrops and dry talus and shaley slopes on mountain tops above timber line; elev. 4000 – 7500 ft.
Ophioglossum pusillum	northern adder's tongue	Draw-down-zone of ponds; near springs in open, moist, meadows
Sidalcea hickmanii ssp. *pillsburiensis*	Lake Pillsbury checkerbloom	One known site is in chaparral and knobcone pine vegetation, near an ephemeral drainage.
Tracyina rostrata	beaked tracyina	Valley and foothill grasslands
Mosses and Lichens		
Mielichhoferia elongata	elongate copper moss	Foothill woodland habitat, on moist rocks and soil; tolerates heavy metals/serpentine; up to 3550 ft. elev.
Peltigera gowardii	veined water lichen	In small perennial and seasonal streams; grows fully submerged
Sulcaria badia	bay horsehair lichen	Grows on trees in oak and and douglas-fir woodlands
Fungi		
Tricholomopsis fulvescens	tawny tricholomopsis	On well-rotted conifer logs, low elevation, high moisture

Analysis Methodology

A majority of the proposed units for the North Shore project are contiguous with units for the previous Lakeshore project. Those units were surveyed for botanical resources during the Lakeshore project analysis. Additional units, along with associated units for roadside hazard tree removal, were surveyed

for botanical resources in 2019. Surveys were conducted by both Forest Service personnel and by contractors conducting surveys for Ranch Fire BAER invasive species work. Although only one sensitive species occurrence was found during these surveys, numerous infestations of invasive species were documented.

For herbicide treatments, risk assessment worksheets were completed for each proposed herbicide. These worksheets generate risk summaries that are quantified as hazard quotients for a variety of direct and indirect exposure scenarios. Results are calculated for diverse organisms, including mammals, birds, fish, invertebrates, and humans.

Existing Condition

Special Status Plant Species

There is one known occurrence of the Forest Service Sensitive plant species *Calycadenia micrantha* within the project boundary. It is southwest of Little Pinnacle and within reforestation unit #4. This occurrence was also within a recent roadside hazard tree removal unit; the site was flagged for avoidance.

There are no known federally Threatened, Endangered, Proposed, or Survey and Manage plant species within the project area.

Invasive Plant Species

The Ranch Fire area was widely (although not completely) surveyed for invasive species in 2019, especially targeting areas near roads and suppression disturbance. Based on these and previous surveys, there are 253 mapped locations of 13 different non-native invasive species within the North Shore project area. These sites comprise a total of 435 acres; see Table 2.

Table 2. Summary of invasive plant species found in the North Shore project area.

Species	Common Name	# Sites	Acres	Priority
Bromus madritensis ssp. rubens	Red brome	17	169.1	3
Bromus tectorum	Cheatgrass	20	109.6	3
Carduus pycnocephalus	Italian thistle	13	8.9	2
Centaurea melitensis	Maltese starthistle	9	1.6	2
Centaurea solstitialis	yellow starthistle	32	6.4	2
Cirsium vulgare	bull thistle	32	23.4	2
Foeniculum vulgare	sweet fennel	1	0.1	1
Hypericum perforatum	Klamathweed	56	10.8	2
Melilotus officianalis	white sweet clover	1	0.2	1
Rubus armeniacus	Himalayan blackberry	8	5.3	3
Spartium junceum	Spanish broom	2	0.4	1
Taeniatherum caput-medusae	medusahead	14	3.9	2
Verbascum thapsus	common mullein	48	95.7	2
TOTAL		**253**	**435.4**	

Each species is assigned a priority rank for treatment. Priority rank 1 species are targeted for eradication in the project area, due to the presence of very few sites and very little total acreage. Priority 2 species are targeted for control, with eradication of small and/or remote sites. Priority 3 species are generally fairly widespread on the landscape, and are targeted for containment. In addition to the species-level priority ranks, certain sites, such as landings, parking and staging areas, will also be assigned a higher priority for treatment.

Environmental Consequences

Direct effects involve physical damage to plants or their habitat. Tree harvest and fuels reduction operations have the potential to directly affect plant species, resulting in death, altered growth, or reduced seed set through physically breaking, crushing, burning, scorching, or uprooting plants. Herbicides, formulated to kill plants, have the potential to injure or kill plant species upon contact, depending upon the selectivity of the herbicide, timing of the application, and sensitivity of the plant species. Direct effects of herbicides vary according to the chemical composition and application rate of the herbicide.

Indirect effects are separate from an action in either time or space. These effects, which can be beneficial or detrimental to special status species, may include changes in plant community composition or indirect effects of herbicide application, such as off-target drift, surface runoff, or leaching. Invasive plant treatments are completed with the intention of altering plant community composition by decreasing invasive plant cover and increasing the habitat available to native plant species, including special status plants. Indirect beneficial effects are one of the primary goals of the control and eradication of invasive plants when they occur in suitable habitat for rare plants or in close proximity to existing occurrences of rare plants, and for native vegetation community composition.

Current inventories of Sensitive plant species capture the impact of past human actions and natural events, and are therefore implicit within the existing conditions. Cumulative effects could occur when the direct and/or indirect effects of one of the action alternatives on a given species add incrementally to the effects of past, present, and reasonably foreseeable future actions.

For botanical resources, some impacts will not change regardless of alternative. These analyses are grouped as appropriate to minimize repetition.

Biological Assessment

According to the US Fish and Wildlife Service, possible listed plant species in the project area include the Threatened *Howellia aquatilis* (water howellia) and Endangered *Sidalcea keckii* (Keck's checker-mallow).

Water howellia is a small aquatic annual that occurs in the draw-down zone of small ponds that are shaded by forest vegetation. It is currently known on the Mendocino National Forest from seven ponds in the Covelo Ranger District; the nearest occurrence is almost 50 miles from the North Shore project area. There are no occurrences of water howellia nor suitable habitat within the project area. I have determined that none of the alternatives of this project will have any direct, indirect, or cumulative effects on water howellia.

Keck's checker-mallow is an annual forb, known conclusively only from the Sierra foothills of Tulare and Fresno counties. Some plants collected from Colusa County were tentatively identified as *S. keckii* in 2009, but this is under review and will be determined by genetic testing. The species has never been

identified or collected from Mendocino NF lands. I have determined that none of the alternatives of this project will have any direct, indirect, or cumulative effects on Keck's checker-mallow.

Biological Evaluation and Survey and Manage Species

The species addressed in this section are listed in Table 1 above. The two Survey and Manage vascular plant species on the MNF (the orchids *Cypripedium fasciculatum*; clustered lady's-slipper and *Cypripedium montanum*; mountain lady's slipper) are also on the Sensitive list, so they will be addressed together.

Alternative 1: No Action

Under the no action alternative, no project-related ground disturbing activities will take place. This alternative would therefore have no direct effects on Forest Service Sensitive or Survey and Manage plant species.

However, the proposed invasive species treatment would also not occur, or be much reduced to existing manual treatments, and this would likely lead to increased spread and density of invasive species, especially along roads. The one known occurrence of the Sensitive species *Calycadenia micrantha* straddles a road, and it could be negatively impacted by increased competition from invasive species encroaching on the site. There could therefore be some negative indirect effects on Forest Service Sensitive species by implementing the no action alternative.

Alternative 2, 3, and 5: Proposed Action and Alternatives that also include herbicide use

There is one known location of the Sensitive species *Calycadenia micrantha* within proposed reforestation unit #4. The site will be flagged for avoidance, but because it straddles a road and some plants occur right up to the road surface, there is a risk of direct effects to individuals from vehicles and equipment, especially if vehicles drive or park off the main road surface, even if the site is otherwise excluded from ground-disturbing activities. Such actions are likely to affect individuals, but are unlikely to threaten the entire occurrence or cause the species to trend toward federal listing.

Possible negative indirect effects could occur due to invasive treatments in these alternatives. Although any herbicide application would take place at least 25 ft away from any Sensitive species occurrence, drift or runoff of herbicides could cause negative indirect effects to plants, especially near the edges of the site. These indirect effects may affect individuals, but the effects are unlikely to threaten the entire occurrence or cause the species to trend toward federal listing.

Indirect effects may also be beneficial to Sensitive plant species if the proposed invasive species treatments occur. Decreasing the extent and density of invasive plant species increases the habitat available for native plant species, including Sensitive species.

For cumulative effects on Sensitive plant species in the project area, past, current, and reasonably foreseeable future events include past forest management and wildfires, the 2018 Ranch Fire, the Bartlett roadside hazard tree removal project, and other future forest management activities. These actions would add cumulatively to the potential direct and indirect effects of the action alternatives. While there is always a risk of damage to individual plants of a Sensitive species, the effects are not expected to be severe enough to threaten viability or cause species to trend towards federal listing.

Alternative 4: Proposed Action without the use of herbicides

This alternative combines the possibility for direct effects to Sensitive species of action alternatives 2, 3, and 5 with some of the indirect effects of the no action alternative. In summary, possible negative direct effects to the Sensitive species *Calycadenia micrantha* could be due to trampling of roadside plants by vehicles or equipment. Such actions are likely to affect individuals, but are unlikely to threaten the entire occurrence or cause the species to trend toward federal listing.

Under this alternative, the proposed invasive species treatment would not occur, or be much reduced to existing manual treatments, and this would likely lead to increased spread and density of invasive species, especially along roads. The one known occurrence of the Sensitive species *Calycadenia micrantha* straddles a road, and it could be negatively impacted by increased competition from invasive species encroaching on the site. There could therefore be some negative indirect effects on Forest Service Sensitive species by implementing alternative 4. However, this alternative poses no risk of negative indirect effects to sensitive species due to herbicide drift, which is a risk of alternatives 2, 3, and 5.

Protection Measures

Known occurrences of Endangered, Threatened, and Sensitive plant species are flagged for avoidance with yellow-and-black striped flagging prior to implementation. The following specific activities should be avoided within a flagged avoidance area:

- Constructing landings
- Decking logs
- Creating burn piles, either by hand or with machines
- Use of heavy equipment, including masticators
- Planting trees, except under the guidance of a Forest Service botanist

Invasive Species Risk Assessment

Alternative 1: No Action

Under the no action alternative, neither ground disturbing activities nor proposed invasive species treatments will take place. The absence of equipment use and ground disturbance would decrease the risk of spread and introduction of invasive species, though because most current infestations occur along roads, regular vehicle use of roads represents an existing low background risk. Additionally, under this alternative the proposed invasive species treatments would not occur, so the risk of spread of invasive species is much higher than it would be under the proposed action. The overall invasive species risk for the no action alternative is **moderate**.

Alternative 2, 3, and 5: Proposed Action and Alternatives that also include herbicide use

The equipment used to implement this project will be frequently entering and/or passing through roadside infestations of non-native invasive species. This equipment is likely to expand existing infestations and spread seeds to other portions of the project area. The existence of many weed propagules already within the project area combined with the extensive ground disturbance caused by this project indicates a high risk of expansion and/or spread of existing sites. This risk will be somewhat mitigated by implementing the proposed herbicide treatments, but it is likely that some of the proposed equipment use and ground disturbance will take place before all of the invasive treatments are

completed, so the risk is not fully reduced. The overall invasive species risk for these action alternatives is therefore **moderate**.

Alternative 4: Proposed Action without the use of herbicides

This alternative combines the ground disturbance of the proposed action with the lack of invasive species treatment of the no action alternative. As described in the previous section, under the proposed action the equipment used will be frequently entering and/or passing through roadside infestations of non-native invasive species. This equipment is likely to expand existing infestations and spread seeds to uninfested areas/units within of the project area. The existence of many weed propagules already within the project area combined with the extensive ground disturbance that would be caused by this project indicates a high risk of expansion and/or spread of existing sites. In addition, under this alternative, this increased spread of invasive species would not be mitigated by the herbicide treatment proposed in alternatives 2, 3, and 5. Therefore the risk of spread not directly related to project activities is moderate, like that for the no action alternative. The combination of extensive ground disturbance and no herbicide treatment creates the highest risk of any of the action alternatives proposed for this project. The overall invasive species risk is **high** for this action alternative.

Proposed herbicides and target species

Table 3: Proposed herbicide treatments by species

Herbicide	Target Species	Max. application rate
Aminopyralid	starthistle, thistles, klamathweed, sweet clover	7 oz/acre
Fluazifop	cheatgrass, medusahead, red brome	1 pint/acre
Imazapyr	mullein, fennel, plus landings	1 quart/acre
Triclopyr BEE	broom, blackberry	2 quarts/acre

Standard Mitigations to Reduce Invasive Species Introduction and Transfer

Equipment operators should always thoroughly clean their equipment prior to entering the project area. Properly cleaned equipment will have no visible soil, plant parts, or seeds present. Avoid staging equipment and vehicles in infested areas.

References

USDA Forest Service. 1995. Mendocino National Forest Land and Resource Management Plan. Pacific Southwest Region. Willows, CA.

USDA Forest Service. 2005. Forest Service Manual 2670 – Threatened, Endangered, and Sensitive Plants and Animals. National Headquarters. Washington, D.C.

USDA Forest Service. 2011. Forest Service Manual 2900 – Invasive Species Management. National Headquarters. Washington, D.C.